APRIL 1979
No. 4

FISHING INFORMATION

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FISHING INFORMATION

APRIL 1979, No. 4

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J. Carr, Deputy Director

PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) charts of winds and pressures for the eastern North Pacific, 4) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 5) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. It contains a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

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Submitted for publication - May 25, 1979

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ENVIRONMENTAL CHARTS ANALYZED BY:

F. Miller (Figures 8 and 9)
J. Renner (Figures 1, 2, 3, 4, 5, 6, 7, and 15 day supplement)

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National Ocean Survey, Pacific Marine Center, Seattle, Washington

Fisheries Research Board of Canada, Pacific Environment Institute, West Vancouver, British Columbia by L. F. Giovando from observations by:
J. Redhead at Langara Island Light; D. Geiger at Cape St. James Light;
L. Collins at Kains Island Light; M. V. Stewart at
Amphitrite Point Light

Scripps Institution of Oceanography, La Jolla, California

Expendable bathythermograph and salinity observations are made by the mates and engineers of the *Hawaiian Queen* of the Matson Navigation Co. The data are processed under supervision of D. R. McLain at the NMFS Pacific Environmental Group, Monterey, California, using computer facilities of the Fleet Numerical Weather Central, Monterey. The project is partially supported by the National Science Foundation and the Office of Naval Research.

Sea Surface Temperature and Environmental Conditions

Forrest R. Miller

Eastern North Pacific

During April the subtropical high pressure center normally shifts northward to 35°N, 150°W (Figure 1). The Aleutian low pressure center normally weakens and shifts eastward into the northern part of the Gulf of Alaska. The band of maximum west winds and most intense wind mixing of the ocean surface layers is normally found between 45°N and 50°N where storms develop during april.

During April 1979 the position and intensity of the sub-tropical high pressure center was near normal. However, a ridge of relatively high pressures extended into the Gulf of Alaska and frequently caused surface pressures as much as 9 millibars above normal to develop in the northern part of the Gulf. The Aleutian low pressure center was displaced 35° of longitude west of its normal position resulting in surface pressures 4 to 10 millibars below normal north of 35°N and west of 170°W. Most of the high surface winds and intense ocean mixing were found north of 30°N and west of 160°W. Wind mixing of the ocean surface layer was also above normal west of northern Baja California (Figure 2).

Over most of the eastern north Pacific the sea surface temperature (SST) pattern was near normal (Figure 3) with one significant exception. From 45°N to 52°N, between 140°W and 152°W, isotherms bulged northward where there was a greater than normal influence of southerly flow associated with the subtropical high pressure system. In this area, SST's were more than 1°C above normal. This positive SST departure (Figure 5) represented the only remaining winter and spring 1979 warming over the northeast Pacific. The above normal SST's developed, in part, as a result of the westward displacement of the Aleutian low and below normal surface wind mixing and storm activity in the southern part of the Gulf of Alaska. Although SST's were near normal over most of the eastern north Pacific in April 1979, they were more than 1°C warmer than in April 1978 over a large area from 28°N to 52°N between 140°W and 160°W (Figure 7). This was due largely to the more frequent and intense storm activity in April 1978 southeast of the Aleutian low where negative SST departures were 1 to 2°C below normal. Along the U.S. west coast and south of 30°N between 120°W and 135°W, SST's were near normal in April 1979 as compared to a year ago when they were 1 to 2°C above normal due to a weak subtropical high pressure system east of 145°W.

Western North Pacific

During April 1979 the Aleutian low pressure system was the dominant atmospheric feature north of 35°N. Surface pressures were 6 to 10 millibars below normal east of Kamchatka, and surface winds were strong from 40°N to 50°N. The subtropical high pressure system was centered along 30°N with central pressures 2 to 3 millibars above normal. The north Pacific ocean front was exceptionally strong and separated into two branches east of Japan between 37°N and 42°N out to 160°E (Figure 4). The ocean front was stronger than usual east of 160°E where the north-south SST gradient was pronounced from 40°N to 50°N. South of 40°N, SST's were more than 1°C above normal; and to the north of 40°N, SST's were 1 to 2°C below normal west of 160°E where the surface front was strongest. Over the past several months the positive SST departures have been accentuated by the persistent southerly surface winds and the northward flowing Kuroshio Current along the coast of Japan. North of Japan, the westward extension of the Aleutian low southeast of Kamchatka resulted in strong northerly surface winds and increased southward flowing surface currents.

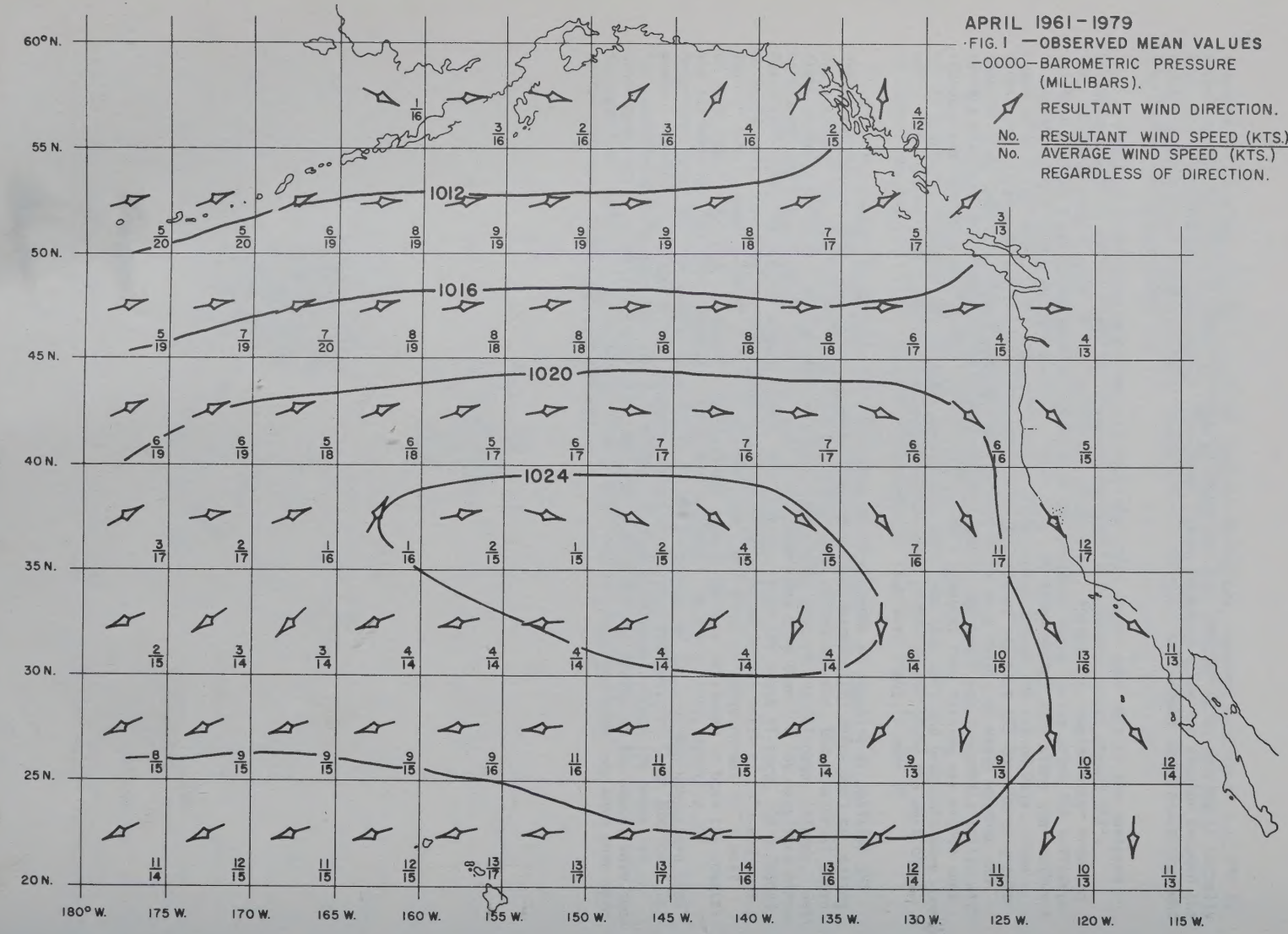
Eastern Tropical Pacific

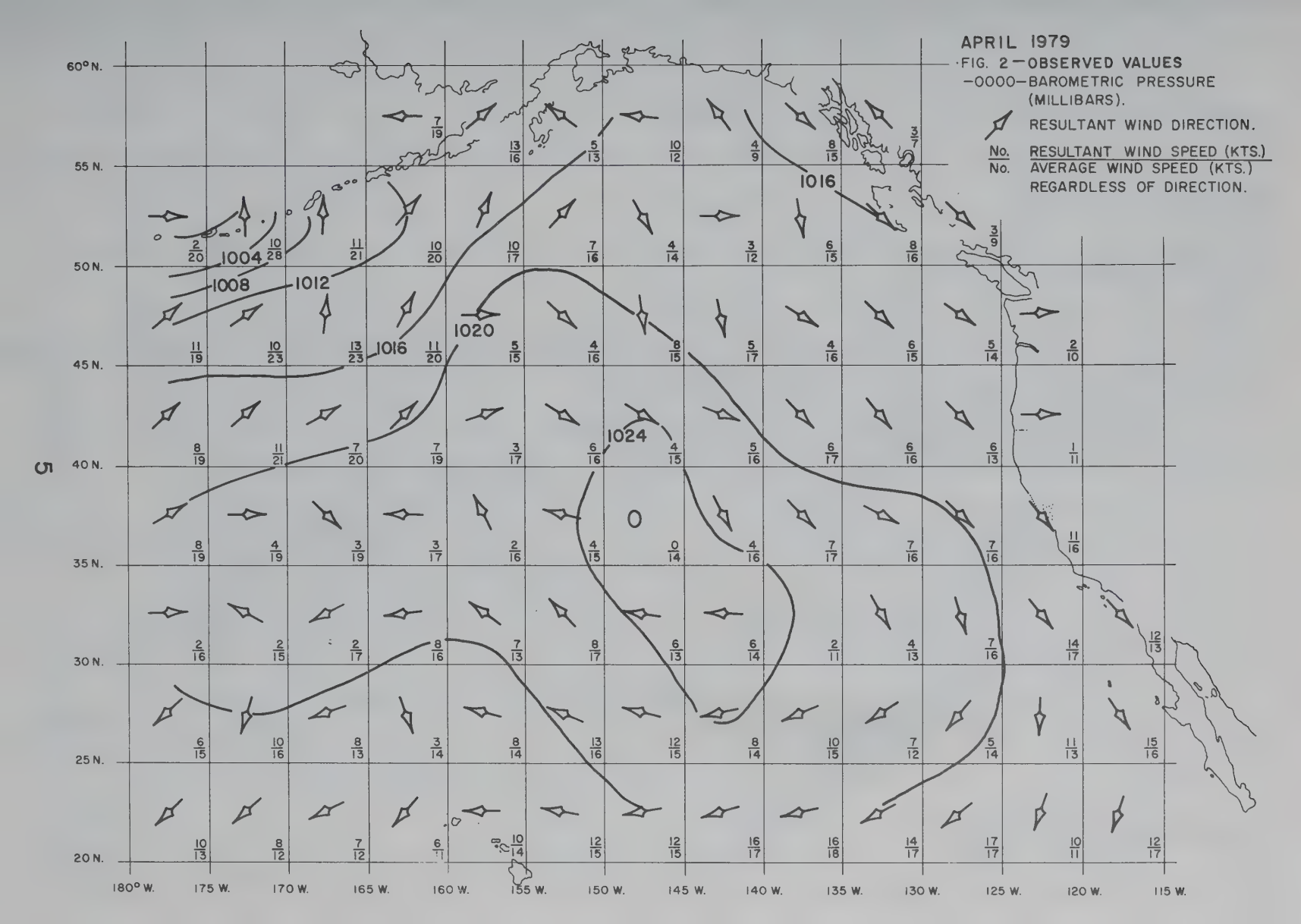
During April, SST's normally increase less than 1°C over most of the tropical Pacific north of the equator. Along the equator between 5°N and 5°S and east of 110°W, SST's normally

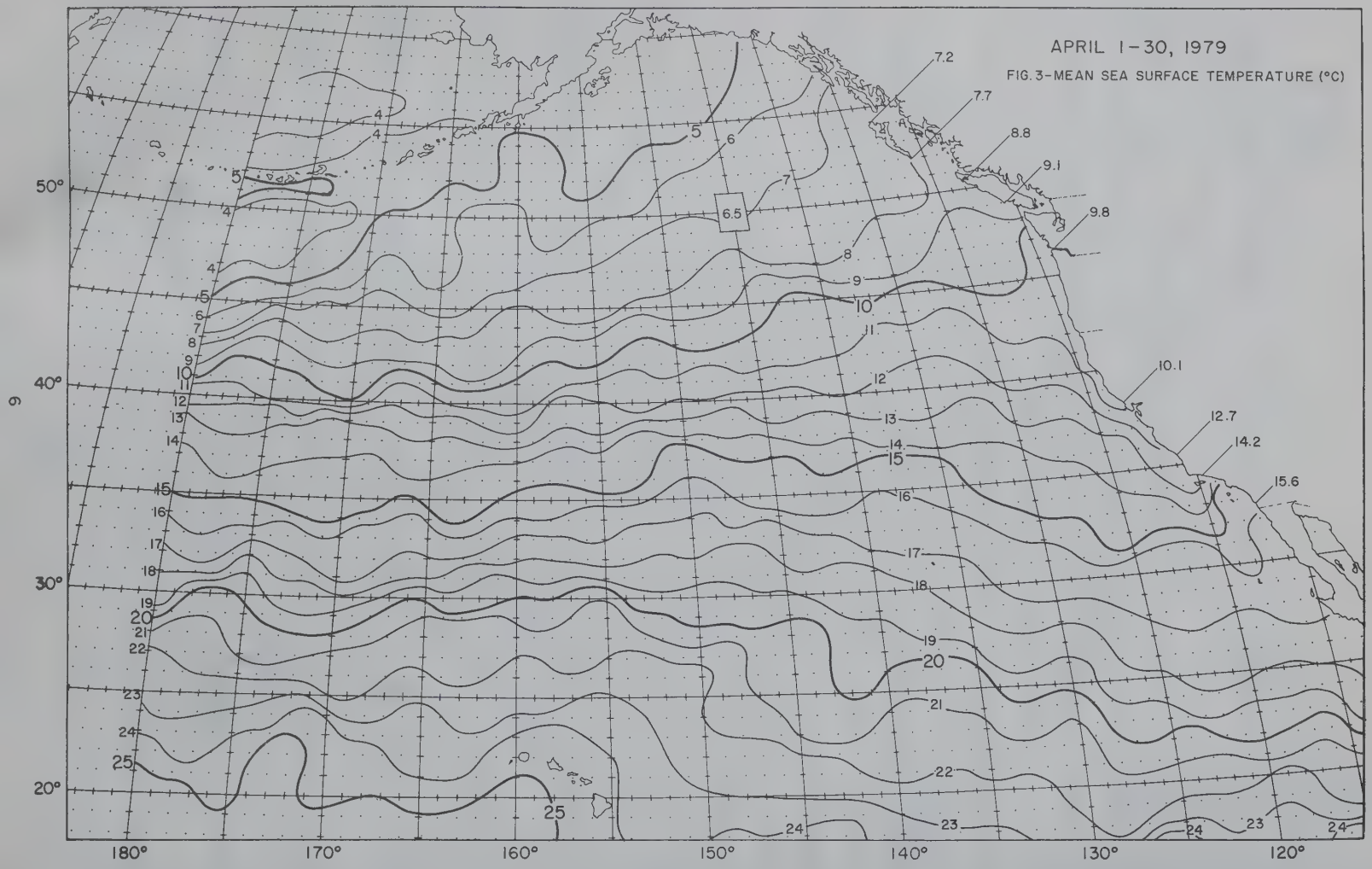
decrease 1°C from March to April. In the southern hemisphere, seasonal cooling of 1 to 2°C is normal in the Peru Current along the coast of South America. West of 90°W, cooling is normally less than 0.6°C as winter approaches. The ocean frontal boundary along the equator between the Galapagos Islands and Ecuador normally appears with a stronger north-south temperature gradient than during February and March.

In April 1979 the SST pattern and gradients were near normal over most of the northern hemisphere west of 120°W (Figure 8). However, east of 120°W several areas showed SST's 1 to 2°C below normal south of Baja California (Figure 9). Apparently, cooler water from the California Current moved southeastward from Baja and offshore along Mexico under the influence of persistent and strong northwest winds. SST's were 1°C below normal also along the southwest coast of Baja California where isotherms were tightly packed around the tip of Baja. Tuna fishing was active during April in this area. Another area of negative SST departures greater than 1°C developed from 5°N to 10°N between 85°W and 105°W as a result of heavy weather and surface wind activity along the intertropical convergence zone which was frequently active with thunderstorms (no tropical storms) east of 110°W. Most tropical tuna fishing was active east of 115°W between 10°N and 20°N in areas where SST's were less than 29°C and gradients were strongest. Above normal SST's persisted along the south coast of Mexico and along the west coast of Central America where skies were clear and winds and seas were light (Figure 8).

Along the equator from 5°N to 5°S there were no large areas of negative or positive SST departures greater than 1°C. This suggested that no unusual warming (El Niño-type) or cooling was taking place. East of 120°W and from 2° to 4°N north of the equator, the equatorial ocean front appeared to be well established for April, especially east of the Galapagos Islands. West of Ecuador and Peru, a narrow band of negative SST departures more than 1°C has persisted since March 1979 along the coastal branch of the Peru Current. Near the coast of Peru, SST's (based on small numbers of ship reports) appeared to be slightly below normal north of 15°S and more than 1° below normal south of 15°S. Except for some small areas of above normal SST's west of 79°W from 9°S to 15°S, a general cooling trend appears to have developed in both the coastal and offshore (west of 85°W) branches of the Peru Current. In these areas, negative SST departures have persisted partly as a result of the steadiness of the southern hemisphere high pressure system and the associated southeast trade winds along the coast of South America. In the southern hemisphere west of 130°W, negative SST departures greater than 1°C prevailed in those areas where easterly surface winds, associated with passing storms to the south, have been stronger than normal. Also, equatorial upwelling of cooler subsurface water may have been more active than usual during the past two months.

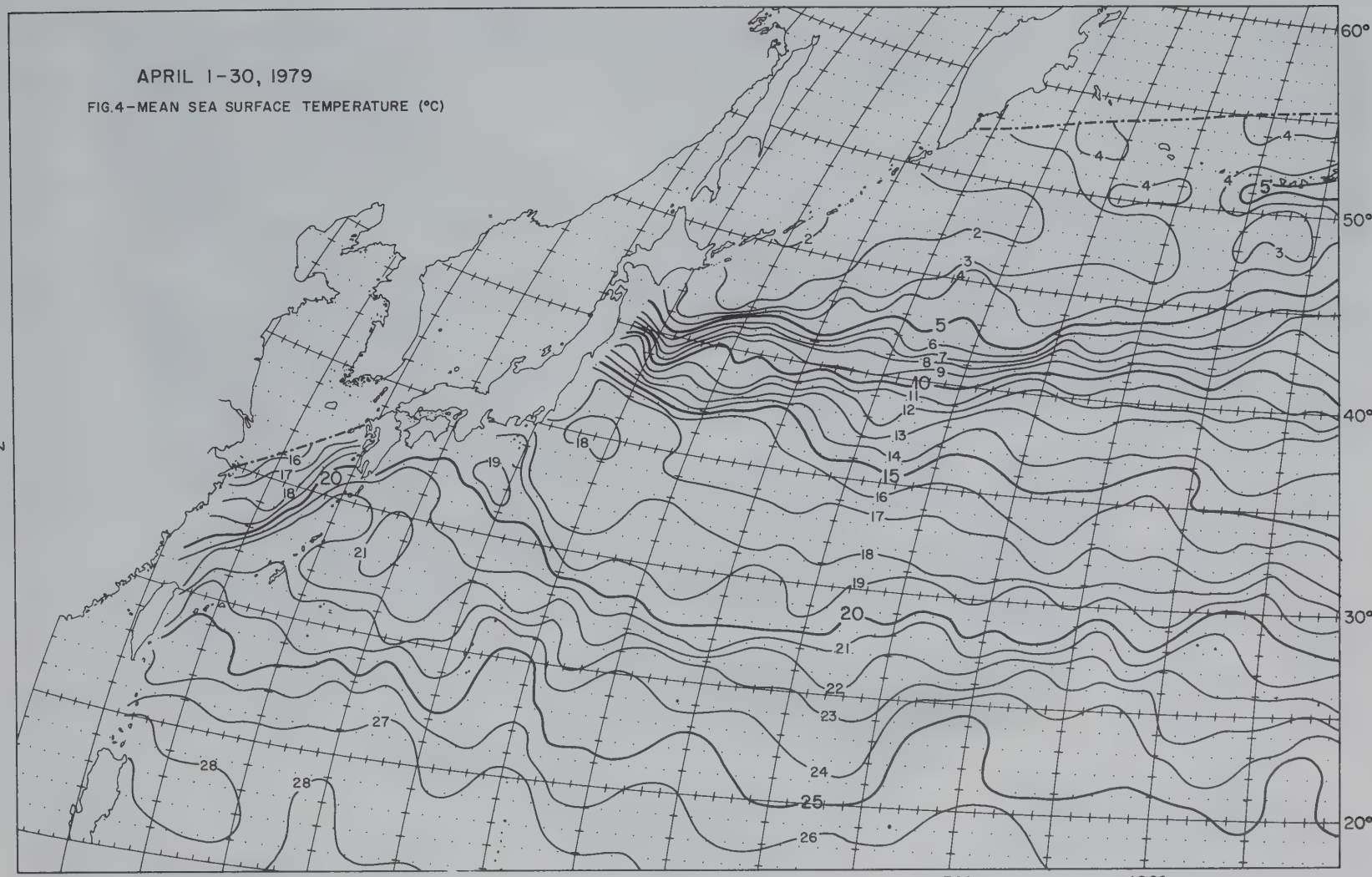

APRIL 1961-1979
FIG. 1 —OBSERVED MEAN VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1012
1016
1020
1024
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

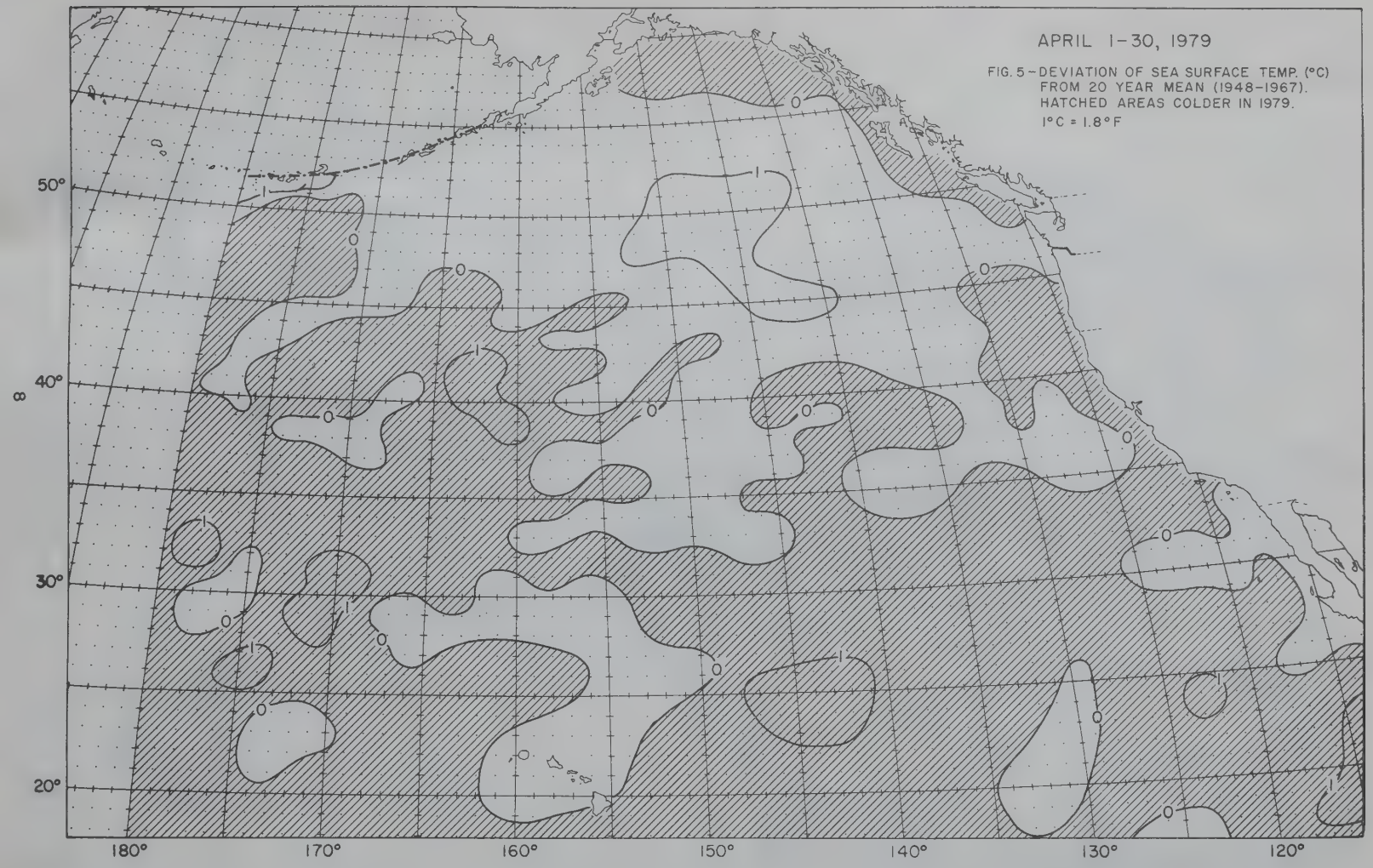

APRIL 1979
FIG. 2—OBSERVED VALUES
-0000-BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1004
1008
1012
1016
1020
1024
1016
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

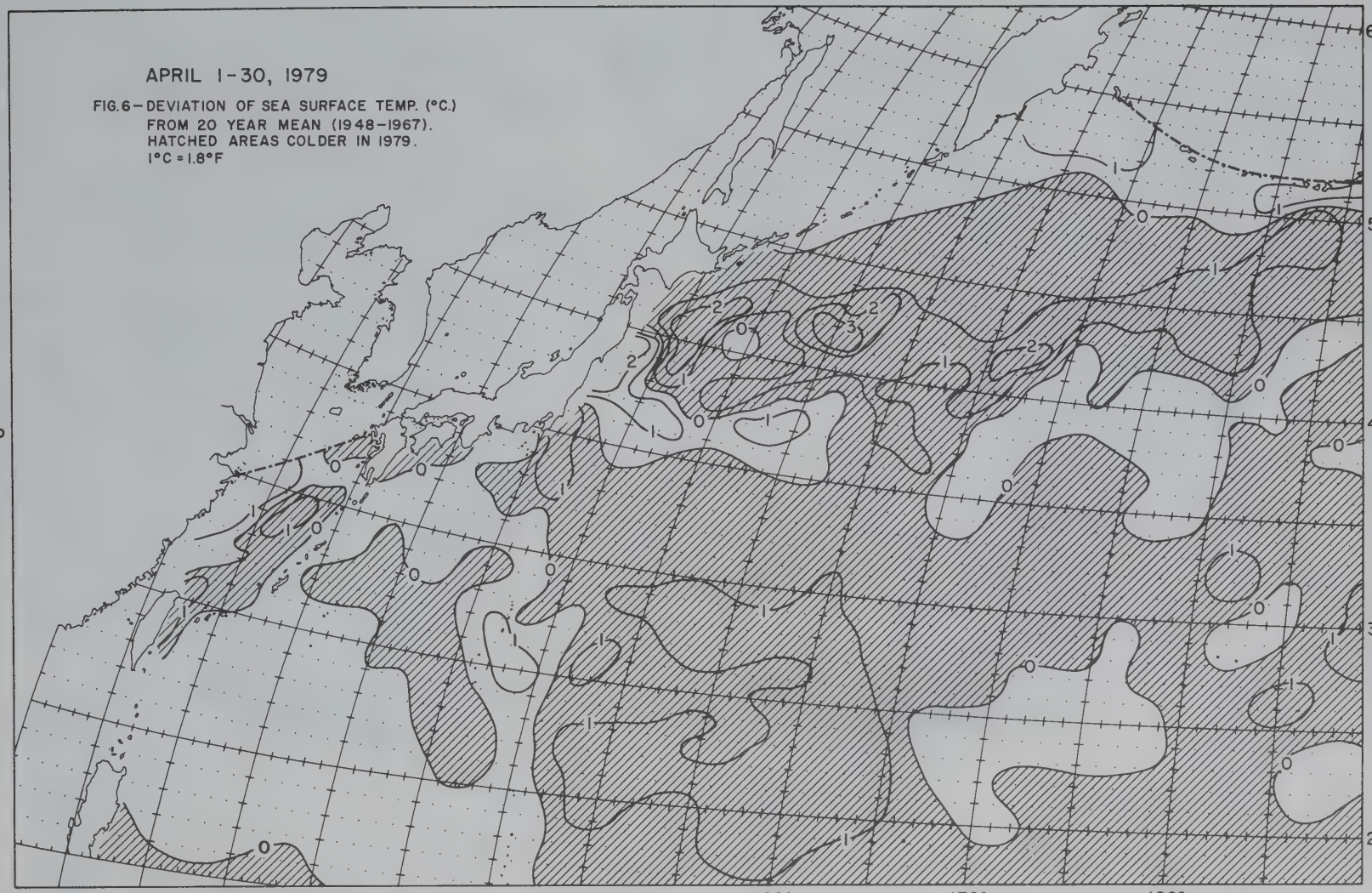

APRIL 1-30, 1979
FIG. 3-MEAN SEA SURFACE TEMPERATURE (°C)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
7.2
7.7
8.8
9.1
9.8
10.1
12.7
14.2
15.6
6.5

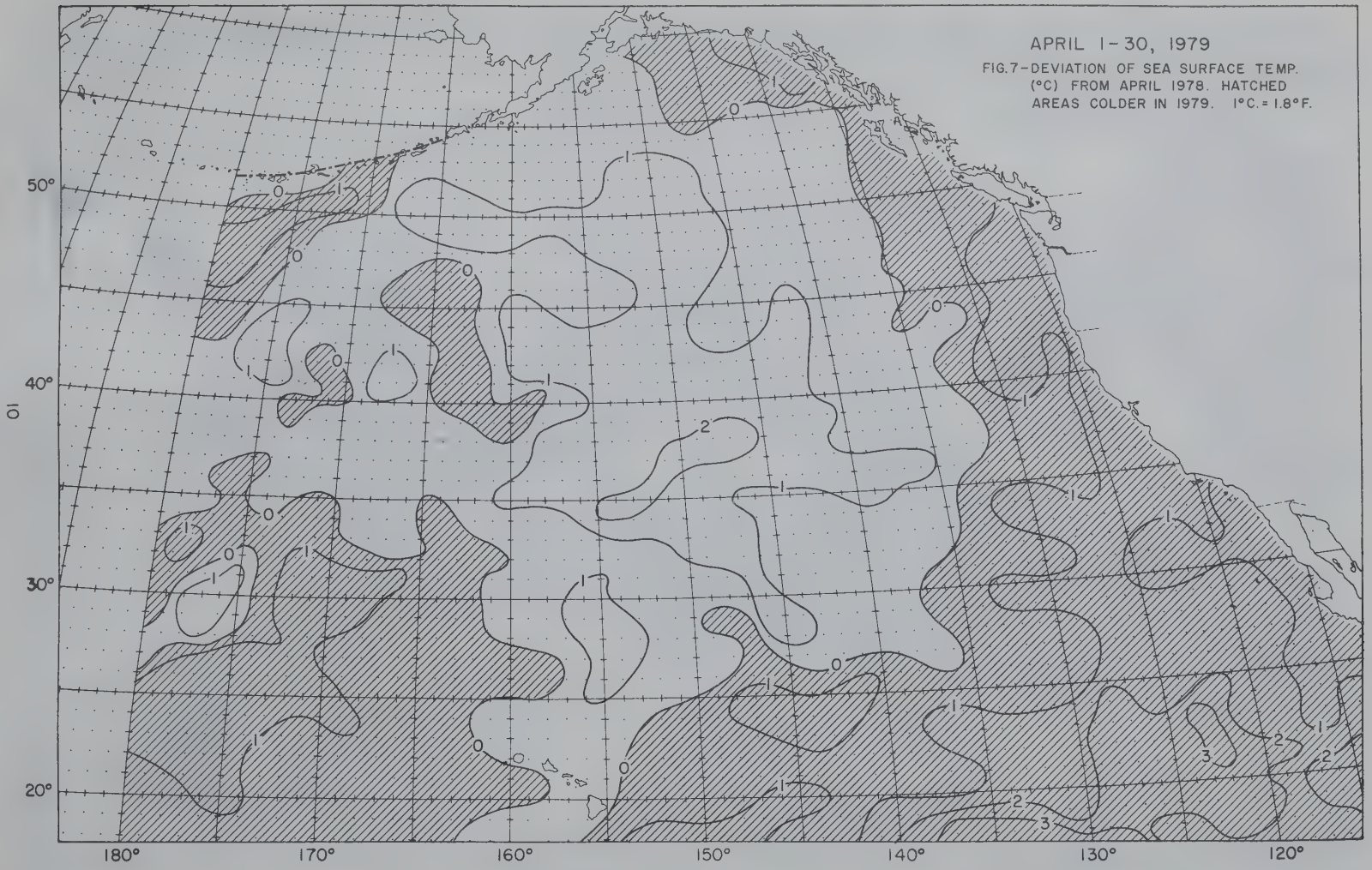
APRIL 1-30, 1979

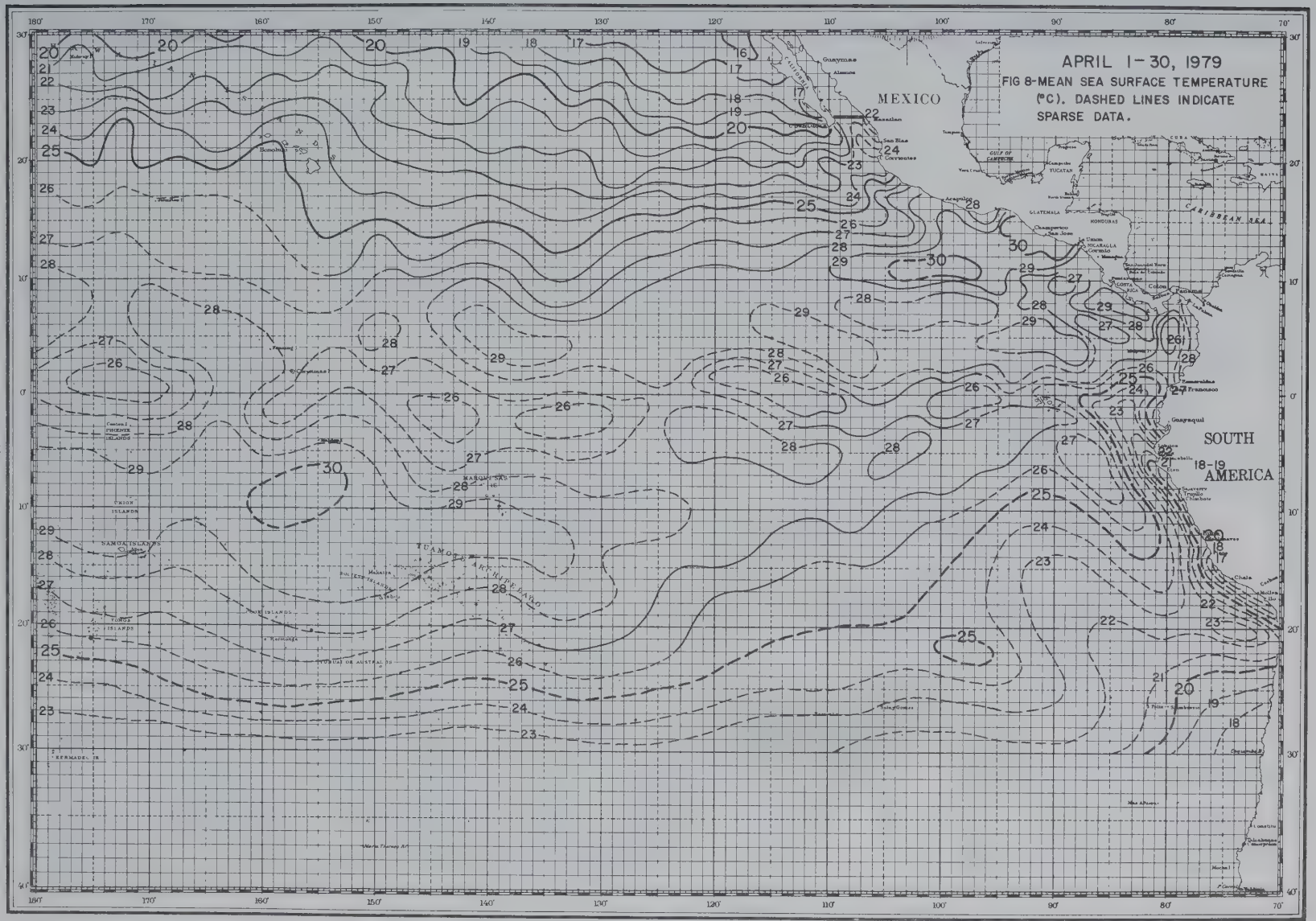
FIG.4-MEAN SEA SURFACE TEMPERATURE (°C)

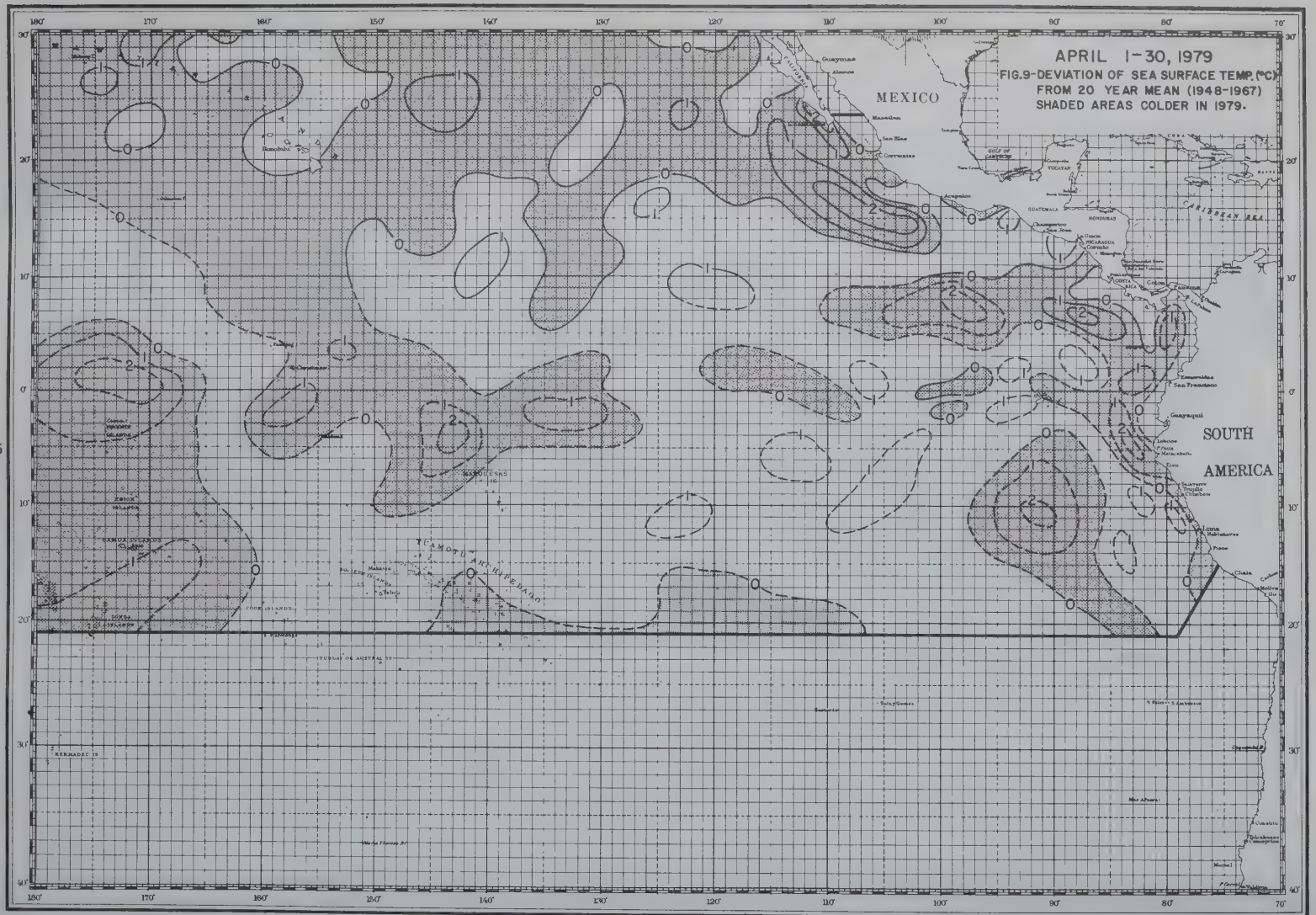



APRIL 1-30, 1979
FIG. 5 - DEVIATION OF SEA SURFACE TEMP. (°C) FROM 20 YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1979.
1°C = 1.8°F
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
1


APRIL 1-30, 1979
FIG.6-DEVIATION OF SEA SURFACE TEMP. (°C.)
FROM 20 YEAR MEAN (1948-1967).
HATCHED AREAS COLDER IN 1979.
1°C = 1.8°F
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


APRIL 1-30, 1979
FIG.7-DEVIATION OF SEA SURFACE TEMP. (°C) FROM APRIL 1978. HATCHED AREAS COLDER IN 1979. 1°C.= 1.8°F.
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°


APRIL 1-30, 1979
FIG 8-MEAN SEA SURFACE TEMPERATURE (°C). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
Acapulco
Manzanillo
San Blas
Corinto
Champerico
Panama
Galapagos Is.
Guayaquil
Callao
Trujillo
Chimbote
Chala
Mollendo
Arica
Iquique
Antofagasta
Coquimbo
Valparaiso
Talcahuano
Mocha I.
Juan Fernandez Is.
Easter I.
Pitcairn I.
Henderson I.
Ducie I.
Oeno I.
Marquesas Is.
Tuamotu Archipelago
Society Is.
Austral Is.
Cook Is.
Samoa Islands
Tonga Islands
Union Islands
Phoenix Islands
Line Islands
Tokelau Is.
Kermadec Is.
Norfolk I.
Lord Howe I.
Gulf of California
Gulf of Tehuantepec
Gulf of Panama
Gulf of Guayaquil
Gulf of Fonseca
Gulf of Campeche
Yucatan
Cuba
Jamaica
Haiti
Panama Canal
Colon
Tampico
Veracruz
Progreso
Belize
Honduras
Nicaragua
Costa Rica
Panama
Ecuador
Peru
Chile
Argentina
Bolivia
Paraguay
Uruguay
Brazil
Venezuela
Colombia
Guyana
Suriname
French Guiana
Trinidad
Tobago
Barbados
Curacao
Aruba
Bonaire
Netherlands Antilles
Puerto Rico
Virgin Islands
Bahamas
Florida
Texas
Louisiana
Mississippi
Alabama
Georgia
South Carolina
North Carolina
Virginia
Maryland
Delaware
New Jersey
New York
Connecticut
Rhode Island
Massachusetts
Vermont
New Hampshire
Maine
Canada
Greenland
Iceland
Ireland
England
France
Spain
Portugal
Morocco
Algeria
Tunisia
Libya
Egypt
Israel
Lebanon
Syria
Turkey
Greece
Italy
Yugoslavia
Albania
Bulgaria
Romania
Hungary
Austria
Switzerland
Germany
Netherlands
Belgium
Luxembourg
Denmark
Sweden
Norway
Finland
Russia
Poland
Czechoslovakia
Iran
Iraq
Kuwait
Saudi Arabia
Yemen
Oman
United Arab Emirates
Qatar
Bahrain
Pakistan
India
Afghanistan
China
Japan
Korea
Taiwan
Philippines
Indonesia
Malaysia
Singapore
Thailand
Burma
Vietnam
Cambodia
Laos
Australia
New Zealand
Papua New Guinea
Fiji
Solomon Islands
Vanuatu
New Caledonia
Nauru
Kiribati
Tuvalu
Wallis and Futuna
Tonga
Samoa
American Samoa
Guam
Micronesia
Marshall Islands
Palau
Northern Mariana Islands
Hawaii
Alaska
Aleutian Islands
Bering Sea
Chukchi Sea
Beaufort Sea
Arctic Ocean
Hudson Bay
Baffin Bay
Labrador Sea
Gulf of St. Lawrence
Gulf of Mexico
Caribbean Sea
Mediterranean Sea
Black Sea
Caspian Sea
Red Sea
Persian Gulf
Arabian Sea
Bay of Bengal
South China Sea
Sea of Japan
Yellow Sea
East China Sea
Philippine Sea
Coral Sea
Tasman Sea
Great Barrier Reef
Great Australian Bight
Timor Sea
Arafura Sea
Banda Sea
Java Sea
Flores Sea
Celebes Sea
Sulu Sea
Molucca Sea
Ceram Sea
Halmahera Sea
Bismarck Sea
Solomon Sea
Coral Sea
Tasman Sea
Great Barrier Reef
Great Australian Bight
Timor Sea
Arafura Sea
Banda Sea
Java Sea
Flores Sea
Celebes Sea
Sulu Sea
Molucca Sea
Ceram Sea
Halmahera Sea
Bismarck Sea
Solomon Sea


APRIL 1-30, 1979
FIG.9-DEVIATION OF SEA SURFACE TEMP.(°C)
FROM 20 YEAR MEAN (1948-1967)
SHADED AREAS COLDER IN 1979.
MEXICO
SOUTH
AMERICA
CARIBBEAN AREA
TUAMOTU ARCHIPELAGO
MARQUESAS
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
30°
20°
10°
0°
10°
20°
30°
40°

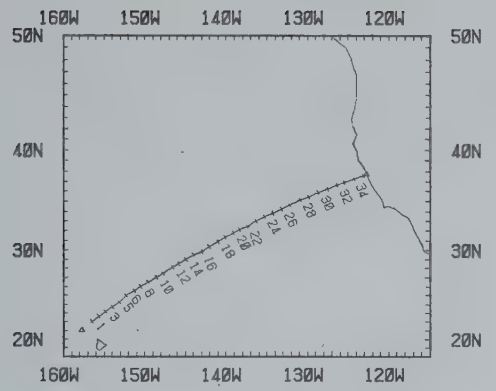


FIGURE 10

SHIP HAWAIIAN QUEEN

VOYAGE 239

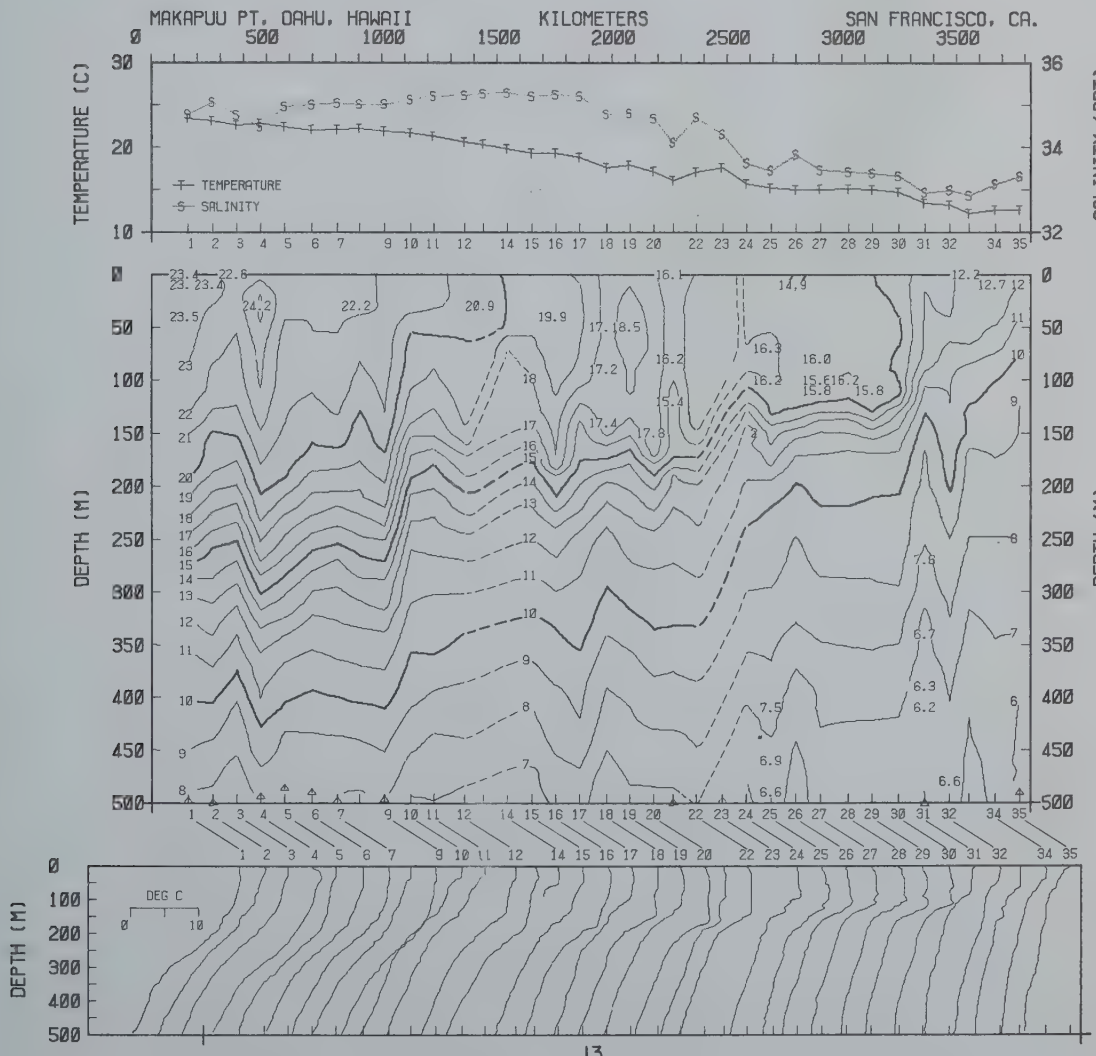
MATSON

MAKAPUU PT. OAHU, HAWAII

- SAN FRANCISCO, CA.

15 APR 1979 - 21 APR 1979

NOAA-NMFS PEG MONTEREY, CA.



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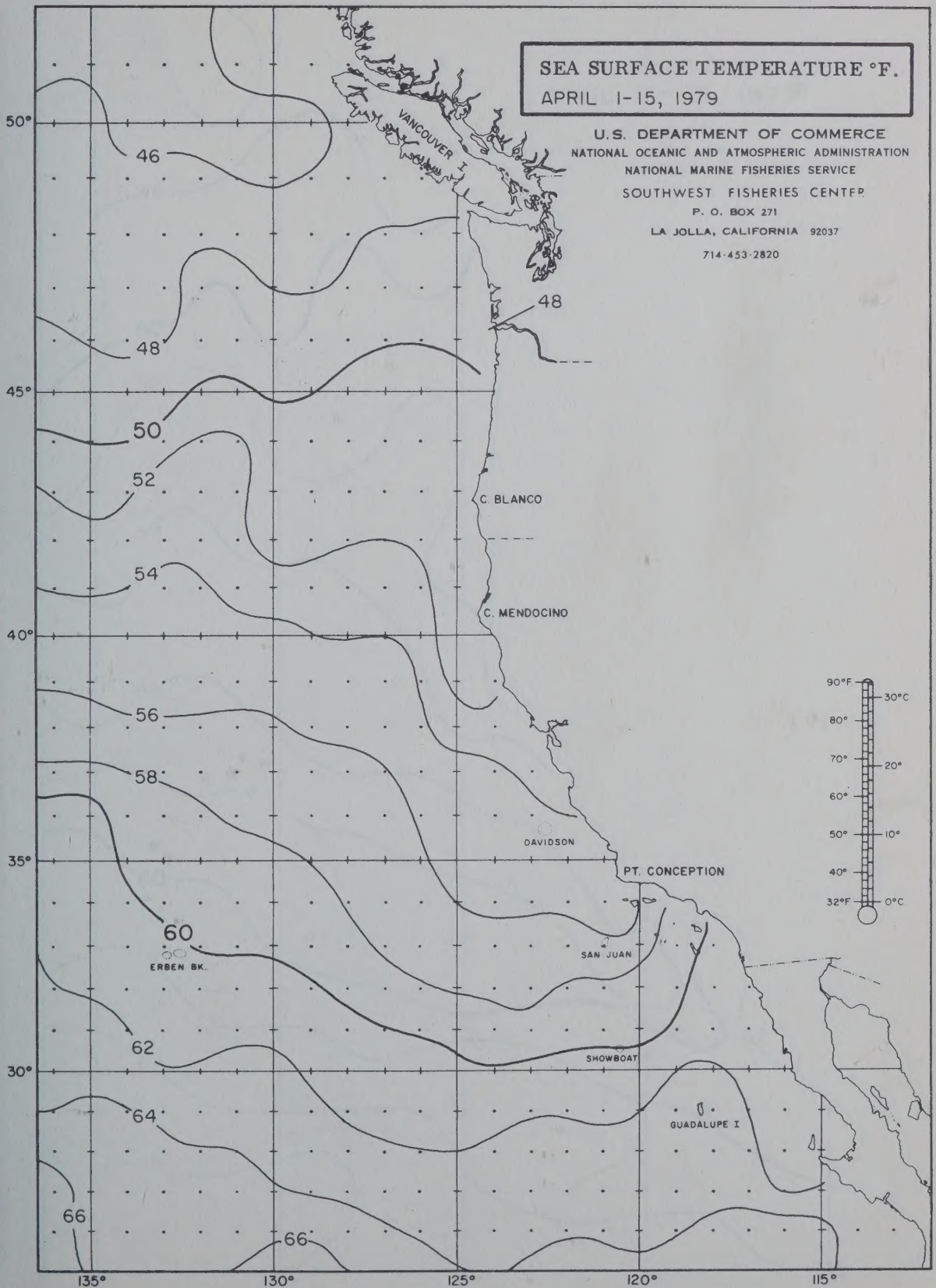

FISHING INFORMATION – supplement